CLAIMS

1. A printing method comprising:

providing a substrate having a surface coated with a coating comprising at least 25% nano-silica by weight; and

printing on the coated surface with a liquid toner comprising pigmented polymer particles and a carrier liquid.

2. A printing method according to claim 1 wherein the coating comprises an acrylic material.

3. A printing method according to claim 2 wherein the acrylic material comprises a cross-linked polyacrylic ester.

4. A printing method according any of the preceding claims wherein the coating is UV cured.

5. A printing method according to any of the preceding claims wherein the coating comprises at least 30% silica.

6. A printing method according to claim 5 wherein the coating comprises at least 35% silica.

7. A printing method according to claim 6 wherein the coating comprises at least 40% silica.

8. A printing method according to claim 7 wherein the coating comprises at least 45% silica.

9. A printing method according to claim 8 wherein the coating comprises at least 50% silica.

10. A printing method according to any of the preceding claims wherein the silica has a size of between 5 and 50 nanometers.

11. A printing method according to claim 10 wherein the silica has a size of between 10 and 40 nanometers.

12. A printing method according to claim 11 wherein the silica has a size of between 10 and 20 nanometers.

13. A printing method according to claim 12 wherein the silica has a size of about 16 nanometers.

14. A printing method according to any of the preceding claims wherein the silica is not chemically bonded to the rest of the coating.

Sub A4

15. A printing method according to any of claims 1-13 wherein the silica is chemically bonded to the rest of the coating.

16. A printing method according to any of the preceding claims wherein the coating further comprises an anchorage agent.

17. A printing method according to claim 16 wherein the anchorage agent comprises an amine material.

18. A printing method according to claim 17 wherein the amine material comprises a diamine terminated substance.

19. A printing method according to claim 17 wherein the amine material comprises a monoamine terminated substance.

20. A printing method according to claim 17 wherein the amine material comprises a triamine terminated substance.

Sub A5

21. A printing method according to any of claims 18-20 wherein the substance is Poly(propylene oxide).

22. A printing method according to claim 18 wherein the substance is Poly-oxyelthelene.

23. A printing method according to any of the preceding claims wherein the substrate and the pigmented particles are both acidic.

Sub A6

24. A printing method according to any of the preceding claims wherein the substrate is coated with a polyamide coating between the coating containing silica and the substrate.

25. A printing method according to any of the preceding claims wherein the substrate is PVC.

Sub A7

26. A printing method according to any of claims 1-24 wherein the substrate is PET.

27. A printing method according to any of claims 1-24 wherein the substrate is polycarbonate.

Sub A8

28. A printing method according to any of the preceding claims wherein the coating forms a substantially smooth surface.

29. A printing method according to any of the preceding claims wherein the substrate is a sheet of material.

30. A printing method according to any of claims 1-28 wherein the substrate is a disk.

Sub A9

31. A printing method according to any of the preceding claims wherein the surface of the coating is film.

Sub B3

32. A printing method according to claim 31 wherein the coating is smooth.

Sub B4

33. A substrate comprising:

a sheet of polymer; and

a printable coating in the form of a film, on the polymer sheet comprising at least 25% nano-silica by weight of total solids.

34. A coated substrate according to claim 33 wherein the coating comprises an acrylic material.

35. A coated substrate according to claim 34 wherein the acrylic material comprises a cross-linked polyacrylic ester.

Sub A10

36. A coated substrate according any of claims 33-35 wherein the coating is UV cured.

37. A coated substrate according to any of claims 33-36 wherein the coating comprises at least 30% silica.

38. A coated substrate according to claim 37 wherein the coating comprises at least 35% silica.

39. A coated substrate according to claim 38 wherein the coating comprises at least 40% silica.

40. A coated substrate according to claim 39 wherein the coating comprises at least 45% silica.

41. A coated substrate according to claim 40 wherein the coating comprises at least 50% silica.

Sub A11

42. A coated substrate according to any of claims 33-41 wherein the silica has a size of between 5 and 50 nanometers.

43. A coated substrate according to claim 42 wherein the silica has a size of between 10 and 40 nanometers.

44. A coated substrate according to claim 43 wherein the silica has a size of between 10 and 20 nanometers.

45. A coated substrate according to claim 44 wherein the silica has a size of about 16 nanometers.

46. A coated substrate according to any of claims 33-45 wherein the silica is not chemically bound to the rest of the coating.

Sub A12

47. A coated substrate according to any of claims 33-45 wherein the silica is chemically bound to the rest of the coating.

48. A coated substrate according to any of claims 33-46 wherein the coating further comprises an anchorage agent.

49. A coated substrate according to claim 48 wherein the anchorage agent comprises an amine material.

50. A coated substrate according to claim 49 wherein the amine material comprises a diamine terminated substance.

51. A coated substrate according to claim 49 wherein the amine material comprises a monoamine terminated substance.

52. A coated substrate according to claim 49 wherein the amine material comprises a triamine terminated substance.

A13

53. A coated substrate according to any of claims 50-52 wherein the substance is Poly(propylene oxide).

54. A printing method according to claim 50 wherein the substance is Poly-oxyelthelene.

A14

55. A coated substrate according to any of claims 33-54 wherein the substrate is acidic.

56. A coated substrate according to any of claims 33-54 wherein the substrate is coated with a polyamide coating between the coating containing silica and the sheet.

57. A coated substrate according to any of claims 33-56 wherein the sheet is PVC.

58. A coated substrate according to any of claims 33-56 wherein the sheet is PET.

59. A coated substrate according to any of claims 33-56 wherein the sheet is polycarbonate.

60. A coated substrate according to any of claims 33-59 wherein the coating is smooth.